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STANFORD RESEARCH INSTITUTE
Menlo Park, California 94025 • U.S.A.

20 December 1974

Proposal for Research

SRI No. ISH 74-266

TECHNICAL SERVICES

Part One--Technical Proposal

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I OBJECTIVE

The purpose of the program is to determine the characteristics of paranormal functioning by which individuals obtain or infer information about their environment, wherein such information is not available by any known channel.

The program is divided into two categories, basic research and applied research. The purpose of the basic research effort is to identify the physiological and psychological characteristics of individuals possessing paranormal abilities, and to identify neurophysiological correlates and basic mechanisms involved in such functioning. The purpose of the applied research effort is to explore experimentally the potential for applications of paranormal abilities, with special attention given to accuracy and reliability.

II PROPOSED PROGRAM

A. Objective

Stanford Research Institute proposes to undertake a one-month research program to investigate the abilities and characteristics of a gifted individual whose services will be made available by the client. The program is to consist of a basic research effort and an applied research effort. The basic research effort will be directed toward the identification of measurable characteristics possessed by the designated individual and will include a thorough medical, psychological, and neuropsychological evaluation carried out jointly by the Stanford Hospital and Palo Alto Medical Clinic. The data will be compared with that obtained under identical protocol with six other subjects whose paranormal functioning is being investigated under a parallel effort.

The applied research effort will consist of replication with this individual of a series of screening tests in paranormal functioning carried out with previous subjects. The tests proposed are (a) remote viewing of natural targets, i.e., attempts at description of geographical sites and pieces of equipment at locations physically remote from the subject and connected by no known information channel, (b) reproduction of simple line drawings hidden from the subject but viewed by an experimenter, a variant including reproduction of drawings executed with special materials of low density, and (c) determination of the state of a four-state electronic random stimulus generator (electronic lock analog).

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B. Technical Approach

1. Basic Research

(a) Medical Evaluation

The medical evaluation of the designated individual of interest has been assigned to the Palo Alto Medical Clinic. Coordination of the program is being handled by Robert Armbruster, M.D., Director of the Clinic's Department of Environmental Medicine.

The testing procedures fall into six categories:

(1) General physical examination, including complete medical and family history;

(2) Laboratory examinations, including SMA-12 panel blood chemistries, protein electrophoresis, blood lipid profile, urinalysis, serology, blood type and factor, pulmonary function screening, and 12-lead electrocardiogram;

(3) Neurological examination, including comprehensive and electro-encephalogram (sleeping and routine);

(4) Audiometric examination, including comprehensive, Bekesy bone conduction, speech discrimination, and impedance bridge test;

(5) Ophthalmologist examination, including comprehensive, card testing, peripheral field test, muscle test, dilation funduscope, and indirect ophthalmoscopic and fundus examination;

(6) EMI brain scan.

(b) Psychological Evaluation

The psychological evaluation of the gifted individual of interest has also been assigned to the Palo Alto Medical Clinic. Coordination of the program is being handled by Dr. J.E. Heenan, Chief Clinical Psychologist of the Department of Psychiatry.

The evaluation consists of:

(1) In-depth interviews, including objective events and subjective views relating to the discovery and enhancement of paranormal capacities; socioeconomic, cultural, familial, religious environment; outstanding peaks, traumas; values, motivation, interpersonal style;

(2) Wechsler Adult Intelligence Scale (W.A.I.S.);

(3) Minnesota Multiphasic Personality Inventory (M.M.P.I.);

(4) Benton Visual Memory Test and Wechsler Memory Scale;

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(5) Thematic Apperception Test (T.A.T.) and Rorschach projective tests;

(6) Bender Gestalt Visual Motor Test;

(7) Luscher color test;

(8) Strong Vocational Interest Blank;

(9) Edwards Personality Preference Scale (E.P.P.S.).

(c) Neuropsychological Evaluation

In addition to the measurement of the physiological components of the neurological system covered in the medical evaluation, a neuropsychological profile is to be obtained by the administration of the Halstead-Reitan Neuropsychology Test Battery. This phase of the program is being handled by Dr. Ralph Kiernan of the Department of Neurology, Stanford Hospital.

The test battery consists of:

(1) Halstead Category Test;

(2) Tactile Performance Test;

(3) Speech Perception Test;

(4) Seashore Rhythm Test;

(5) Trail Making Test;

(6) Knox Cube Test;

(7) Halstead-Wepman Aphasia Screening Test;

(8) Raven Progressive Matrices;

(9) Verbal Concept Attainment Test;

(10) Buschke Memory Test;

(11) Finger-Tapping Test;

(12) Dynamometer Grip Strength;

(13) Groove Pegboard Test.

The results of the medical, psychological, and neuropsychological evaluations shall be compared and contrasted with those of six other subjects whose paranormal functioning is being examined.

2. Applied Research

One of the key issues in a program of this nature is the establishment of criteria capable of differentiating individuals who are apparently gifted in paranormal functioning from those who are not.

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Three experimental paradigms were chosen to act as screening tests on the basis that these tests had been useful for such purposes prior to this program (in the sense that certain apparently gifted individuals did exceedingly well on at least one of the tests, whereas the results of unselected volunteers did not differ significantly from chance expectation). The tests are (a) remote viewing of natural targets, (b) reproduction of simple line drawings hidden from the subject but viewed by an experimenter, and (c) determination of the state of a four-state electronic random stimulus generator. The tests are also considered to be useful analogs of certain operational situations.

The first test constitutes a so-called "free-response" paradigm in which the subject originates freely about contents of his awareness; furthermore, the channel in general may involve both direct perception of the remote site and perception of the mental contents of an observer at the site. The second test is more constrained than the first in that the target information is more analytical or abstract, being associated with a graphical representation of an item of interest rather than the item itself. The third test is the most constrained in that the target is blind to all participants in the experiment and the subject's choice is precisely constrained. The details of these tests are given below.

For the purpose of screening, the criteria as to what constitutes a paranormal result was chosen arbitrarily, viz:

> For the purpose of screening, a result is to be considered unequivocally paranormal if the a priori probability for the occurrence of the result by chance, under the null hypothesis, is $\leq 10^{-6}$.

Although the above requirement is exceedingly strict by usual psychophysiological standards, it is chosen here because (a) the controversial nature of the subject requires strict handling, and (b) in our work and elsewhere, a bimodal distribution has been observed empirically in which a subset of individuals participating in paranormal research produce results at a level of statistical significance $p \leq 10^{-6}$ in comparison with the bulk of individuals who cluster about the mean as expected. Therefore, we base our criteria on an observable natural division into clearly functional and nonfunctional categories.

(a) Remote Viewing of Natural Targets

The first screening test is based on previous SRI research results which indicate that it is possible for a subject to describe randomly chosen geographical sites located several miles from the subject's position and demarcated by some appropriate means. A variant of this experiment involves using a technological piece of equipment within SRI asa target.

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This experiment consists of a series of double-blind tests involving local targets in the San Francisco Bay area which can be documented by independent judging. Target locations within 30 minutes driving time from SRI are randomly chosen from a list of targets kept blind to subject and experimenters and used without replacement.

To begin an experiment, an experimenter is closeted with a subject at SRI to wait 30 minutes to begin a narrative description of the remote location. A second experimenter obtains a target location from the target pool and proceeds directly to the target without communication with the subject or experimenter remaining behind. The second experimenter remains at the target site for an agreed-upon 30-minute period following the 30 minutes allotted for travel. During the observation period, the remote viewing subject is asked to describe his impressions of the target site into a tape recorder. A comparison is made when the experimenter returns.

Following a series of experiments, the results are subjected to independent judging on a blind basis by SRI scientists not otherwise associated with the research. The judges are asked to blind match locations, independently visited, against typed manuscripts of tape-recorded narratives of the remote viewer. A given narrative can be assigned to more than one target location. A correct match requires that a transcript of a given date and time be associated with the target of that date and time. Probability calculations are on the basis of the a priori probability of the obtained series of matches by chance, conservatively assuming assignment without replacement on the part of the judges. As an example, reference 1 contains results obtained with a gifted subject under this protocol.

(b) Line Drawings

A pool of fifty simple line drawings of everyday objects has been drawn, randomized, and placed in a secure location.

During experimentation, experimenters and subject are separated by having the subject enter a separate room so that from that time forward the subject is at all times visually and acoustically shielded from personnel and material at the target location.

Following isolation a target from the pool of fifty is chosen by a randomization technique. The subject's task is then to reproduce with pen on paper the line drawing now displayed at the target location.

Following a period of effort not to exceed half an hour, the subject may either pass (when he does not feel confident) or indicate he is ready to submit a drawing to the experimenters, in which case the drawing is collected by an experimenter before the subject is permitted to see the target. The experiment is then repeated with replacement until ten drawings have been obtained from the subject.

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To obtain an independent evaluation of the correlation between target and response data, the experimenters submit the data for judging on a blind basis by two SRI scientists not otherwise associated with the research. The judges are asked to match the response data with the corresponding target data (without replacement). Reference 1 includes an example of results obtained with a gifted subject under this protocol.

(c) Four-State Electronic Random Stimulus Generator

The determination of the state of a four-state electronic random stimulus generator comprises the third screening test. The target is in the form of one of four art slides randomly chosen ($p = 1/4$) by an electronic random generator. The generator does not indicate its choice until the subject indicates his choice to the machine by pressing a button (see Figure 1). As soon as the subject indicates his choice, the target slide is illuminated by provide visual and auditory (bell if correct) feedback as to the correctness or incorrectness of his choice. Until that time both subject and experimenter remain ignorant of the machine's choice, so the experiment is of the double-blind type. Five legends at the top of the machine face are illuminated one at a time with increasing correct choices (6, 8, 10, ...) to provide additional reinforcement. The machine choice, subject choice, cumulative trial number, and cumulative hit number are recorded automatically on a printer. Following trial number 25, the machine must be reset manually by depressing a RESET button.

A methodological feature of the machine is that the choice of a target is not forced. That is, a subject may press a PASS button when he wishes not to guess, in which case the machine indicates what its choice was, and neither a hit nor a trial is scored by the machine, which then goes on to make its next selection. Thus, the subject does not have to guess at targets when he does not feel that he has an idea as to which to choose.

Under the null hypothesis of random binomial choices with probability 1/4 and no learning, the probability of observing k successes in n trials is approximated by the probability of a normal distribution value

$$\geq (k - \frac{n}{4} - \frac{1}{2}) \; / \; \sqrt{3n/16} \quad .$$

For the purpose of screening, in our program each subject is required tocomplete 100 25-trial runs (i.e., a total of 2,500 trials). As an example, data from four of six subjects in the parallel effort mentioned previously are tabulated in Table 1.

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TABLE 1

SCREENING DATA: FOUR-STATE ELECTRONIC RANDOM STIMULUS GENERATOR

Subject	Mean Score/100 Trials Over 2,500 Trials	Binomial Probability
1	25.76	0.22
2	29.36	3×10^{-7}
4	25.76	0.22
6	25.40	0.33

On the basis of this test, Subject 2, whose scores are plotted in Figure 2, qualifies as a gifted individual, having satisfied the criterion of producing a result whose a priori probability under the null hypothesis is $p < 10^{-6}$.

C. Statement of Work

1. SRI personnel shall undertake a research program of approximately one-month duration to investigate the abilities and characteristics of the designated individual to be supplied by the clients.

2. SRI shall arrange for the designated individual to participate in the medical, psychological, and neurological evaluation program described in B.1. (a), (b), and (c), and shall prepare a summary analysis comparing and contrasting the results with those obtained with previous subjects who have undergone identical test procedures.

3. The individual sent to SRI by the clients shall participate in the screening procedure described in B.2. (a), (b), and (c). In remote viewing test (a), five Bay Area locations and five SRI technological equipment areas shall be used as targets. In the line drawing experiment (b), ten drawing experiments shall be conducted. In four-state electronic random generator test, 2500 trials are to be completed by the subject.

4. In view of the exploratory nature of this program, 15 percent of the effort will be set aside to explore, with the clients' cognizance, avenues of research of interest to the client, e.g., card sorting experiments involving discrimination between blank cards and cards written on with special materials of low density, etc.

D. Reporting Schedule

A technical report detailing the tests and their results will be delivered 60 days after the commencement date of the contract.

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Throughout the effort the investigators plan to remain in close telephone communication with the client.

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1. R. Targ and H. Puthoff, "Information Transmission Under Conditions of Sensory Shielding," Nature 251, 602 (October 18, 1974).

III QUALIFICATIONS OF STANFORD RESEARCH INSTITUTE

Stanford Research Institute is an independent, nonprofit organization performing a broad spectrum of research under contract to business, industry, and government. The Institute, which was formerly affiliated with Stanford University, was founded in 1946. Its operations include the physical and life sciences, industrial and development economics, management systems, engineering systems, electronics and radio sciences, information science, urban and social systems, and various combinations of disciplines within these fields.

Stanford Research Institute has no endowment; payments by clients under research contracts and grants amount to approximately $70 million annually and are used to cover all operating costs. Such revenue also helps the Institute maintain the excellence of its research capabilities.

SRI's facilities include more than one million square feet of office and laboratory space and incorporate the most advanced scientific equipment, including unique instrumentation developed by the staff. The bulk of these facilities and most of the research staff are located at the Institute's headquarters in Menlo Park, California. Regional office locations include Washington, D.C.; New York City; Chicago; Houston; and Los Angeles.

Of SRI's total staff of 2800 approximately one-half are in professional and technical categories. Some 400 members of the professional staff have Ph.D. or equivalent degrees; 600 others have their Master's degree.

The project leader and other research personnel who would be active in the proposed work are members of the Electronics and Bioengineering Laboratory. This group currently occupies 40,000 square feet of laboratory space, divided into many separate laboratory rooms, technicians' work areas, a machine shop, and a computer room housing a LINC-8 and related terminals and equipment. In addition, a well-equipped computation center is available.

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The Electronics and Bioengineering Laboratory employs a number of technicians and engineering assistants and has available electronics material and test equipment useful in the development and testing of the teaching machines. Especially suited to the work described in the proposal are a number of shielded rooms with various instrumentation available.

Finally, a backup team of psychologists and statisticians can be brought into the project on an internal counsulting basis.

The proposed research will be conducted by SRI staff members within the Electronics and Bioengineering Laboratory under the management of its director, Mr. Earle Jones. The principal investigator will be Dr. Harold Puthoff. Mr. Russell Targ, of the Electronics and Bioengineering Laboratory will be a co-investigator.

In addition to the scientific personnel directly engaged in the research aspects of this investigation, Stanford Research Institute has established an internal technical advisory board. This board consists of several directors of SRI's operating divisions, together with our legal counsel, all under the chairmanship of the senior vice president for research. It is the function of this advisory board not only to make recommendations and approve or disapprove every new direction taken by the Institute in this research area but to monitor related ongoing projects as well.

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EARLE D. JONES, DIRECTOR
ELECTRONICS AND BIOENGINEERING LABORATORY
INFORMATION SCIENCE AND ENGINEERING DIVISION

Specialized professional competence

- Analysis and design of electronic-optical systems, television, facsimile systems including bandwidth compression techniques, electrostatic printing, bioengineering instrumentation, and ultrasonics

Representative research assignments at SRI (since 1956)

- Director, Electronics and Bioengineering Laboratory; responsible for four research programs:
  - Optics: laser applications in oceanography, spectroscopy, and remote detection
  - Ultrasonics: real-time acoustic imaging for medical diagnostics and nondestructive testing
  - Electronics: electrostatic printing, television systems, and facsimile
  - Bioengineering: vision research instrumentation, prosthetic devices, and diagnostic medical instruments
- Manager, Electronics and Optics Group; project leader, Meteorological Satellite Facsimile System, color television cameras
- Research engineer; character generator design; electrostatic label printer; delay line scanning; high density photographic recording of television signals; frequency synthesizers; time domain equalizer; color facsimile; bandwidth compression

Academic background

- B.S. in electrical engineering (1956), Georgia Institute of Technology; M.S. in electrical engineering (1958), Stanford University; graduate work (1965-68) including statistics, communication theory, Fourier optics, and bioengineering

Publications and patents

- Many papers and reviews in the fields of character generators, circuitry, color television cameras, bandwidth compression, television recording, and ultrasonic imaging
- Seven issued U.S. patents in character generators, frequency synthesizer, and electrostatics

Professional associations and honors

- American Physical Society
- Eta Kappa Nu; Phi Eta Sigma; Phi Kappa Phi; Tau Beta Pi

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HAROLD E. PUTHOFF, SENIOR RESEARCH ENGINEER
ELECTRONICS AND BIOENGINEERING LABORATORY
INFORMATION SCIENCE AND ENGINEERING DIVISION

Specialized professional competence

- Tunable laser research and development; quantum electronics; electron beam devices; biofeedback and biomeasurement research

Representative research assignments

- Development of tunable ultraviolet laser source for pollution studies and medical research
- Development of high-power tunable infrared laser source (50-250 microns) for materials research
- Assessment of potential of fiber optics and lasers for use in optical computers
- Development of biofeedback monitors (GSR) for use in educational computers and other man-machine links
- Research and development in biofield measurements

Other professional experience

- Research associate, Hansen Laboratories of Physics and lecturer, Department of Electrical Engineering, Stanford University (1967-71); teaching, textbook author, and research supervisor of Ph.D. candidates in the area of lasers and nonlinear optics
- Consultant on application of lasers to industrial and medical problems and research assistant, Stanford University (1963-67)
- Lt., USNR (1960-63); in-house research and contract monitoring on DoD (NSA) contracts concerned with the development of ultra high-speed (GHz) computers
- Research engineer, Sperry Electronic Tube Division and Sperry Fellow, University of Florida (1958-60); design and testing of electron beam focusing systems for use in microwave tubes

Academic background

- B.E.E. (1958) and M.S.E. (1960), University of Florida; Ph.D. in electrical engineering (1967), Stanford University

Publications and patents

- Coauthor of textbook, *Fundamentals of Quantum Electronics*, Wiley; 2 reference book contributions; 23 papers in professional journals; 14 national symposium papers; numerous technical reports
- 2 patents

Professional associations and honors

- Institute of Electrical and Electronics Engineers; Sigma Tau; Phi Kappa Phi; Phi Eta Sigma; Sigma Xi

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RUSSELL TARG, SENIOR RESEARCH PHYSICIST
ELECTRONICS AND BIOENGINEERING LABORATORY
INFORMATION SCIENCE AND ENGINEERING DIVISION

Specialized professional competence

- Development of new gas lasers; FM laser and supermode laser techniques; laser noise reduction; optical modulation and demodulation; experiments in new gaseous laser media; microwave diagnostic techniques; microwave generation from plasmas

Professional experience

- Sylvania Corporation (1962-72); investigation of techniques for development of new gas lasers, making use of his research with compact, self-contained multi-kilowatt CO_2 lasers
- Technical Research Group (1959-62); experiments in new gaseous laser media
- Polytechnic Institute of Brooklyn; assisted in the establishment of the Electron Beam Laboratory
- Sperry Gyroscope Company, Electron Tube Division (1956-59); experimental work in microwave generation from plasmas; early work in the technology of ultrahigh-vacuum and ion-pump design

Academic background

- B.S. in physics (1954), Queens College, New York; graduate work in physics (1954-56), Columbia University, New York

Publications and inventions

- Author of "Optical Heterodyne Detection of Microwave-Modulated Light," *Proc. IEEE* (1964); coauthor of numerous articles on lasers and plasma oscillations
- Invention of the tunable plasma oscillator at microwave frequencies

Professional associations and honors

- IEEE; American Physical Society; The Optical Society of America
- Awarded the position of research associate with the Polytechnic Institute of Brooklyn

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July 12, 1974

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Enclosed for your perusal is a list of the elements in the physical examination. If you think of additional items you wish to include, or if you desire further information on the items listed, please do not hesitate to call. We will, of course, provide a detailed description of the tests along with the analyses, some of which will be available to you before the end of August.

With best regards,

H. E. Puthoff, Ph.D.
Electronics and Bioengineering

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